Broadband PCS

At the present time, no Broadband PCS licensee has announced an intention to provide dispatch service. Proponents of various technologies, specifically CDMA and to a lesser extent Omnipoint, claim that their equipment will allow users to receive bandwidth-on-demand for high digital data throughput applications. However, there are no operating systems or proposed pricing.

A Hypothetical Monthly Bill

For an ITLA member utilizing a conventional voice dispatch system, analog SMR providers are the most economical alternative among those available. As stated above, service pricing is on a per mobile unit basis. For rural operators with few vehicles, SMR is an alternative if price is the only consideration -- which it is not.

However, from our sampling of ITLA members and the survey responses received, the average number of vehicles -- taxi, limousine, delivery/sedan and van/minibus -- serviced by the communications system of a typical medium to large market operator is 265. Even at the low end of the SMR price range ($12), an average monthly bill of $3,180 and a yearly expense of over $38,000 is the result. In addition to this monthly bill, the taxi operator would be faced with an immediate expense of $265,000 for replacement of the mobile radios in the fleet (at $1,000 per radio, a median price for a dispatch type-radio). Moreover, using conservative assumptions[9], a p.02 grade of service and the Erlang B traffic tables show that a commercial operator would have to dedicate a **9 channel trunked** group to service this load.

Many of the ITLA survey respondents have already implemented analog data dispatch systems. These can generally be found in major metropolitan areas with severe congestion problems. For those ITLA members the average number of one-way transmissions per day is over 85,000. Assuming a relatively modest 100 byte message size, the transmitted byte count is 850,000 per day and 25.5 million per month. The average monthly bill on the ARDIS/RAM system would be

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[9] Assuming one-third of the fleet is in operation, 2 dispatched calls per hour per in-use vehicle, 15 transmissions per dispatched call, 5 seconds per transmission, yields 3.64 Erlangs.

$6,460[10]: a monthly CDPD bill would be **$1.2 million**.

A base station -- transmitter and power amplifier, antennas, line, *etc.* -- normally costs no more than $35,000 to $50,000[11]. These costs are depreciated over their useful life, generally for book purposes 7 to 10 years. Assuming a 7 to 10 year real life on capital equipment, a forced transition to commercial providers of voice dispatch service would represent -- at the lowest end of the price range -- an almost tenfold increase in cost. The circumstances of an operator who had already converted to data dispatch would be worse. Also, operators who have converted to data dispatch systems have generally kept their voice dispatch system as a hot-standby backup in case of a catastrophic failure. Consequently, for those operators who have made the investment in more efficient technology, a forced conversion to commercial systems would require subscription to both voice and data service ---a massive increase in expense.

How Low Can Prices Go?

The foregoing analysis clearly demonstrates the historical economic rationale for private radio service. One can easily see that the consumer's cost for taxi and livery services has been moderated by the industry's investment in its communications systems.

Yet, it is not unreasonable to make the argument that with 150 MHz of spectrum being placed into service from Broadband PCS alone, that prices will fall. However, even if the above-calculated rates were reduced by half, the monthly expenditure would represent a significant increase in expense to large and medium market taxi and livery companies. Moreover, this analysis does not reflect the cost to replace the mobile radios themselves, a very real possibility in a mandated conversion to a commercial system.

Even with a 50% price reduction, this dramatic increase in cost would initially be borne by the

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[10] One ITLA member -- whose data is not included in this survey since it is so far out of the norm -- transmits, on average 800,000 message units per day. Using the same methodology, this company's average monthly bill on the ARDIS/RAM system would be in excess of $608,000.

[11] According to our survey, we can deduce that base station infrastructure is a relatively small portion of the total infrastructure investment of ITLA member companies. The largest expense is for the vehicle-mounted mobile radios, followed by the operator consoles, computer control equipment, tracking software, etc.

companies themselves. Since taxi and livery companies are, in general, licensed by a particular jurisdiction they are also most often subject to rate regulation. Eventually, the cost would be passed on to the consumer, including the elderly, disabled and low-income riders who rely disproportionately on taxis to meet their transportation needs.

Issues of Finance

In the pure financial sense, businesses are not purchased, cash flows are. The prices paid for a wireless business or for raw spectrum at auction represent the individual and collective judgement of the participants regarding the cash flows which will accrue to the purchaser in the future.

Economic policy making, while mindful of supply and demand, more often than not forgets that businesses must generate an adequate return on investment or the investment won't be made. The shape and slope of the supply curve[12] is determined by numerous inputs, one of the most important being the cost of capital.

For the purposes of this discussion, the question presented is whether commercial providers can generate an adequate return on their invested capital at significantly lower prices. As discussed previously, prices for voice dispatch service average $12-$16 per month nationally. Profit margins average 25%-30%. A 50% reduction in service revenue per unit would put most SMR companies out-of-business, unless there was:

1. a dramatic increase in the number of customers;
2. a correspondingly dramatic decrease in operating expense;

So as to offset

3. the reduction in revenue per subscriber; and
4. the increased capital equipment expenditures to service the larger subscriber base.

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[12] The presumption that prices for wireless telecommunications services will fall if the supply of spectrum is increased is probably true, but not necessarily true. The availability of spectrum is only one component of the supply curve for wireless service.

If we increase the supply of McDonalds restaurants -- place one on every corner -- that does not mean that hamburger prices will fall to a tenth of what they are now.

Even if hypothetical 50% price reductions could be tolerated in the short run, profit margins would suffer. Investors in these companies would see a reduction in return. When return on investment falls below what could be made in other alternative investments with less risk, capital flees. While present prices for data transmission computed earlier are astronomical, the same financial principles apply to the investors in these companies as well.

One can reverse-model[13] the prices paid in recent spectrum auctions, using an estimate of the winning bidder's cost of capital, to derive individual expectations of future service pricing, profit margins and capital infrastructure cost. The conclusions drawn is that no one expects price reductions of the magnitude discussed in the previous paragraphs.

If a "price war" does break out in the provision of wireless telecommunications services, there will be winners and losers on the commercial side, about which the Commission is justifiably ambivalent. However, if private radio services are forced to procure service from commercial providers during a period of turmoil, then critical communications needs -- service to the public -- will be adversely affected.

THE FUTURE

The trend within the industry, confirmed by our survey, is implementation of automatic dispatch systems using analog data. Purchase and deployment of automatic dispatch systems is change of an incremental nature, can be prudently managed and justified economically. The basic features and benefits of data dispatch systems are summarized below.

Assigning Attributes to Drivers -- Requests for special service are automatically matched to drivers who can provide the requested service, *e.g.*, will accept credit cards or checks, has been trained to assist disabled persons, permits smoking, has station wagon for extra luggage space, will assist disabled vehicles with a jump start or entry into a locked car, speaks Spanish, *etc.* Quality and speed of service to the public is greatly enhanced.

Customer Identification & History -- The computerized data dispatch systems track each customer's usage of service. When each customer calls for service their profile is

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[13] The most rigorous technique available to calculate investment returns and market value is the "discounted cash flow" (DCF) method. While such an analysis is beyond the scope of this report, such an analysis could be prepared and submitted to the Commission.

automatically available to the service representative. This feature enhances service quality, and speeds the delivery of service.

Trip History -- Every aspect of the customer's request for service is tracked by the system. Tracking trip history is used to resolve disputes, and to monitor customer service and service areas so that proactive steps can be taken for improvement.

Exception Warnings to Dispatcher -- The system will alert the dispatcher if there is a service problem, *e.g.*, too many drivers are rejecting the trip, the driver turns meter on and off too quickly indicating he did not serve the trip, if it takes too long for the taxi's meter to come on, etc.

Message To and From Drivers -- Messages to and from drivers are handled faster and with less air time when sent by a data dispatch system. Typical messages include: call canceled, passenger cannot be found, request for estimated time of arrival (ETA) to passenger pickup, call passenger to come out to vehicle, *etc.* Because computer dispatch communications are more efficient, service to the customer is improved via add-on services such as having the dispatcher telephone the customer to tell them their vehicle has arrived and they should now go outside to meet the driver.

Trip Report -- The system tracks where the requests for service (trips) are being generated and where the taxis and liveries are currently located. Drivers use the trip report feature to determine where they will post to wait for a request for service. This feature enables the drivers to strategically place themselves to speed delivery of service to the public. Moreover, for those companies with multiple base stations, the message can be directed to only that transmitter in which the vehicle is located, eliminating the need for simulcasting.

Miscellaneous -- The computer dispatch system accomplishes many other functions that are used to enhance customer service, *e.g.*, credit card verification, call vehicles in for routine maintenance, emergency distress button to alert dispatch that the driver is in a threatening situation, *etc.* These additional features expand and enhance the taxi and livery industry's ability to provide a variety of services to the public.

With increased capacity, fleet operators demand more from their communications system: more information is passed between driver and dispatch center, and the result is improved service to the public using the same amount of spectrum at little or no increase in cost. However, a forced migration to commercial systems would require taxi and livery fleet operators to limit their

communications to only those messages which provide a quantifiable improvement in profitability, thereby sacrificing improved service to the public in order to minimize expense.

The change to automated dispatch systems using analog data increases throughput and efficiency. Not only is service improved to taxi and livery customers, but all of society benefits when these dispatch systems reduce traffic congestion and automobile pollution by making taxi and livery service delivery more efficient.

For these computerized dispatch systems to work for the taxi and livery industry, asynchronous communications capability and a private radio allocation must continue to exist. The service enhancements and the increase in the speed of service are of significant benefit to the public.

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QUALIFICATIONS

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Since 1983, BIA Consulting has served more than 2,500 clients. The firm's staff of experienced and highly qualified professional consultants, analysts and engineers distinguishes BIA as a leader in strategic and financial consulting services. Focusing on the cellular, paging, PCS, SMR/ESMR, radio, television and cable industries, BIA provides a wide range of financial and strategic consulting services to help our clients define and achieve their personal, professional and organizational goals.

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QUALIFICATIONS OF JOHN P. AUDET

John P. Audet, Senior Financial Consultant, specializes in technical consulting, financial planning, and the strategic evaluation of wireless telecommunications opportunities. Mr. Audet has estimated investment value, and prepared business plans and financing memoranda for participants in various spectrum auctions conducted by the Federal Communications Commission (FCC).

Prior to joining BIA, Mr. Audet served numerous clients in the telecommunications industry as a private consultant. He provided assessment of market dynamics, regulatory outlook, and technological factors impacting the introduction of commercial operations in the Interactive Video and Data Service (IVDS) as well as designing the RF facilities for seven, top-thirty Metropolitan Statistical Areas (MSAs). Mr. Audet counseled numerous clients regarding public policy issues before the FCC in regards to the technological, financial and regulatory impact of proposed Commission actions.

From 1983-1988, Mr. Audet was employed by Advanced Systems Design, an engineering consulting firm providing design services and public policy counsel to clients in the cellular radio, common carrier, and broadcasting industries. During this period he participated in the preparation and submission of testimony in comparative hearing for cellular radio licenses, and designed the radio facilities for over two dozen cellular systems, FM and television broadcast stations, MMDS and ITFS facilities and numerous common carrier microwave links nationwide. During his tenure at Advanced Systems Design, Mr. Audet developed a number of proprietary computer models and programs to facilitate the design and maintenance of radio frequency (RF) telecommunications systems.

In the early 1980's, Mr. Audet was a Director for the Washington Bureau of the Cable News Network (CNN). From 1979 through 1982, Mr. Audet was Assistant to the Director of Engineering during the start-up of commercial television station WMDT-TV. He participated in the design of and purchase negotiations for 2.1 million dollars of studio and transmitter site equipment, oversaw the construction of broadcasting facilities, including a 1000 foot transmission tower, and the renovation of a 20,000 square foot building for offices and studio.

Mr. Audet is a *Summa Cum Laude* graduate of the University of Maryland, UC. He holds a Bachelor of Science degree earned in Finance and Technology & Management. He placed first in the graduating class amongst all disciplines with a 4.0 GPA and was nominated to the Phi Kappa Phi and Alpha Sigma Lambda national honor societies for academic excellence.